

# A new genus of ranine frog (Anura: Ranidae) from Somalia

B. T. Clarke

Department of Zoology, British Museum (Natural History), London SW7 5BD

## Introduction

Lanza (1978) described a new species of ranine frog from the Nogal Valley in northern Somalia and tentatively assigned it to the genus *Hildebrandtia* Nieden, 1907. However, he stressed that 'As the phylogenetic relationships between the various forms which have been included at one time or another under the name *Rana* are very questionable, I prefer to assign the new frog tentatively to *Hildebrandtia* rather than to a new genus'. Lanza consequently named his new species *Hildebrandtia* (?) *largeni*.

In a recent survey of African ranine frogs (Clarke, 1981) based on 22 osteological characters, evidence emerged for the recognition of a new genus to accommodate *H.* (?) *largeni*, but a formal description was delayed pending the examination of further material of Lanza's species. The external morphology and osteology of additional material confirm the necessity to recognize the new genus.

## *LANZARANA* gen. nov.

TYPE SPECIES. *Hildebrandtia* (?) *largeni* Lanza, 1978 : 232.

DIAGNOSIS. (1) Small to moderate African ranine frogs, adult males 42.0–45.2 mm (n = 17); adult, gravid females 43.7–48.5 mm (n = 9) snout-vent length. (2) Skin of dorsum smooth or smooth with low pustules, no dorsolateral folds. (3) Males with external vocal sacs. (4) Fingers moderately long, 2nd shortest, 1st longer than or equal to 4th, 3rd longest. (5) Tips of fingers, 1st and 2nd rounded or slightly expanded; 3rd and 4th rounded or slightly to broadly expanded, truncate, 3rd showing most extreme condition. (6) Inner metatarsal tubercle moderately well developed not compressed. (7) Outer metatarsal tubercle present, distinct. (8) Outer metatarsals not separate, bound in a fleshy sole. (9) Nasals reduced, slip-like, widely separated. (10) Occipital canal absent. (11) Otic plate rudimentary. (12) Zygomatic ramus of squamosal shorter than otic ramus. (13) Preorbital process of pars fascialis of maxilla well developed, rectangular in lateral view. (14) Anterior end of maxilla convex. (15) Pterygoid process of maxilla absent. (16) Anterior process of prevomer moderate, separated from mesial maxilla/premaxilla articulation by a short gap. (17) Palatines present. (18) Distal end anterior ramus of pterygoid moderately long, separated from lateral border of planum antorbitale by short gap. (19) Cervical cotyles slightly separately mesially, type II sensu Lynch, 1971. (20) Base of omosternum moderately forked; greatest space between the arms is once to twice the width of one arm, state 2 of Liem, 1970. (21) Clavicles reduced, widely separated mesially. (22) Sternal style a short compact bony element, tapering slightly anteriorly to posteriorly. (23) 8th presacral and sacral vertebrae fused. (24) Dorsal protruberance of ilium not or slightly differentiated from dorsal prominence, smooth surfaced, confluent with dorsal ilial crest. (25) Distal ends of terminal phalanges of fingers slightly, moderately or markedly expanded, truncate, see (5) above; of toes cone-like.

ECOLOGY AND HABITAT. Specimens collected by Lanza were found in undulate subdesert regions characterized by grass, perennial herb and subshrub steppe. The type series of six males from ca. 10 km N of Garoe were found calling near a soil depression with shallow

flowing water. Further collecting has shown that *L. largeni* is also associated with shallow wells (e.g. 20 km N of Garoe near a tiny well, 2 m deep, in evaporites), in surface puddles, deep wells (at El Ure, Sciu Manas and Rahole) and reservoirs. Lanza (1978) considered that *L. largeni* was 'Almost surely . . . a burrowing species . . .', but later revised this opinion 'I do not think it is a true digging animal' (Lanza, pers. comm.). *Lanzarana* apparently spends much of its life underground, particularly in the north, in burrows, crevices, vacuities and among shrub or tree roots. This mode of life accords with the structure of the inner metatarsal tubercle, moderately well developed but not compressed as in *Hildebrandtia* s.str., and with the bound metatarsals.

The information on ecology and habitat given above is derived from Lanza (1978 & pers. comm.).

*Lanzarana* should be looked for in those parts of Kenya and Ethiopia that afford similar habitats.

**DISTRIBUTION.** At present known only from Somalia, from Halin in the north to an area 30 km SSE of Dinsor in the south (See Fig. 1).

**ETYMOLOGY OF GENERIC NAME.** The genus is named after Professor Benedetto Lanza (Museo Zoologico de 'La Specola', Florence), in recognition of his many contributions to the herpetology of Somalia, and generosity in allowing me to describe this genus.

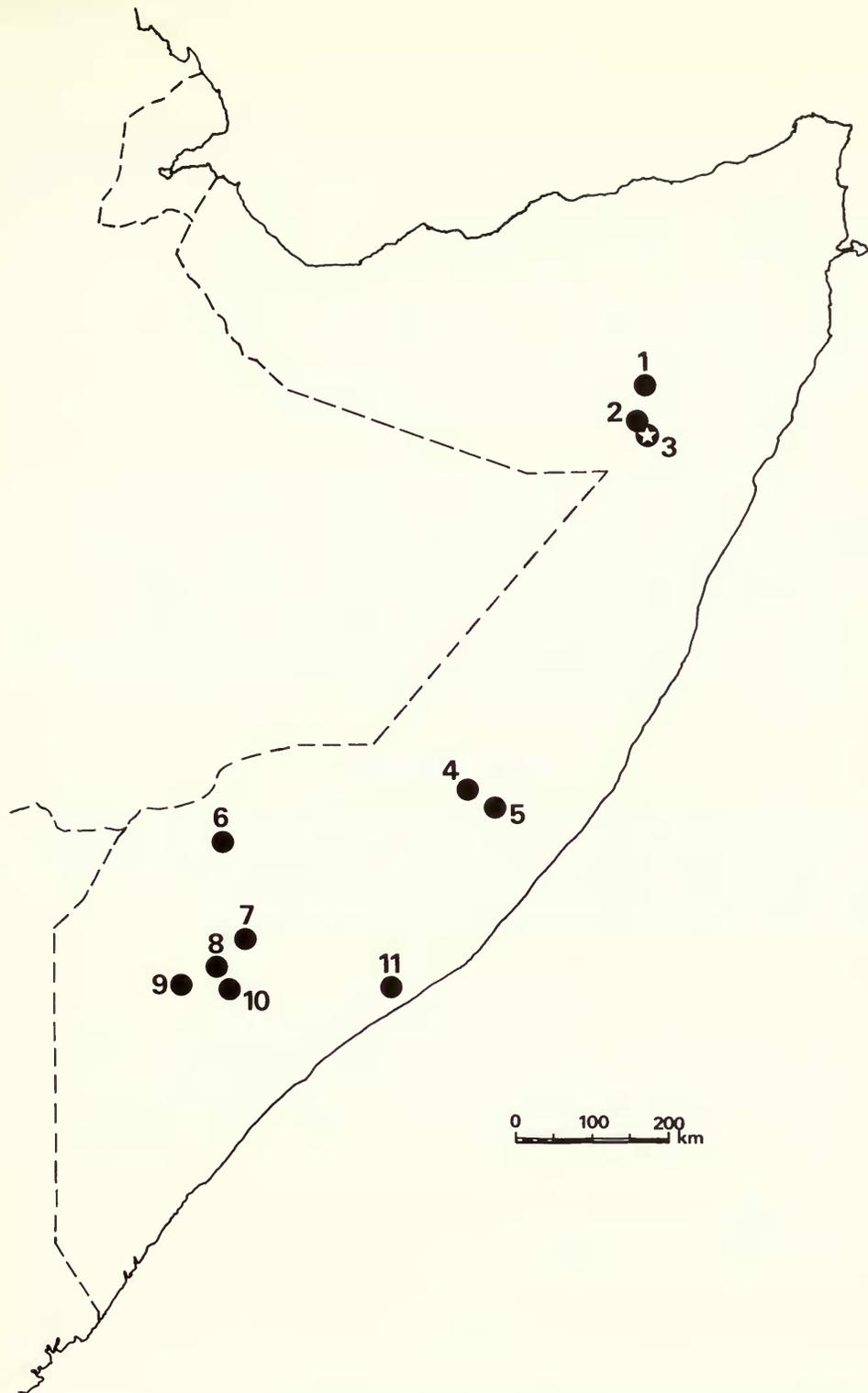
### Relationships with *Ptychadena* and *Hildebrandtia*

Clarke (1981) noted that *Ptychadena*, *Hildebrandtia* and *H. (?) largeni* (= *Lanzarana*) share five derived character states not possessed by any other African ranine genera: loss of palatines; reduced clavicles; short, tapering sternal style, a compact bony element; fusion of 8th presacral and sacral vertebrae; dorsal protuberance of ilium not or slightly differentiated from dorsal prominence, smooth surfaced and confluent with dorsal ilial crest. *Ptychadena*, *Hildebrandtia* and *Lanzarana* are therefore considered a monophyletic group, distinctly separate from all other African ranines.

Comparisons based on external morphology as well as osteological characters suggest an evolutionary sequence: *Ptychadena*—*Lanzarana*—*Hildebrandtia*; with *Ptychadena* as the most primitive in the sequence, *Lanzarana* being an intermediate form but more closely related to *Hildebrandtia* than to *Ptychadena*.

#### (a). External morphology

(1) Dorsal skin folds. In *Ptychadena* there is considerable interspecific variation in the extent and arrangement, ranging from clearly defined to very fine or indistinct; in some species the paravertebral or even all the dorsal folds may be discontinuous, or fragmented. *Lanzarana* has neither paravertebral nor dorsolateral folds, but in some specimens smooth, low scattered pustules are present. In *Hildebrandtia* folds are usually absent although in some specimens of *H. ornata* smooth, low dorsolateral folds may be discernible. (2) Inner metatarsal tubercle. In *Ptychadena* present, poorly to well developed, in some species e.g. *Pt. trinodis* the tubercle may be moderately compressed; in *Lanzarana*, moderately developed, but not compressed; *Hildebrandtia*, well developed and compressed. (3) Outer metatarsal tubercle. Present, indistinct or absent in *Ptychadena*; present in *Lanzarana*; apparently absent in *Hildebrandtia*. (4) Terminal phalanges. *Ptychadena*, tapering, obtusely pointed, 3rd and 4th fingers not dilated, fingers usually moderately long; *Lanzarana* rounded, fingers variable, well rounded to strongly dilated, especially 3rd and 4th (see Lanza, in prep.); *Hildebrandtia* tapering obtusely pointed, fingers usually short, not dilated. (5) Outer metatarsals, separated by web in *Ptychadena* but bound in a fleshy sole in both *Lanzarana* and *Hildebrandtia*.



**Fig. 1** Map showing present, known distribution of *Lanzarana* in Somalia. 1 = Lower wadi Halin, Nogal Valley, 09°00' N 48°30' E, 1550 m. 2 = About 20 km N of Garoe, Nogal Valley. 3 = About 10 km N of Garoe, Nogal Valley, about 08°25' N 48°33' E, c. 500 m (Type locality). 4 = Maas 04°23' N 46°05' E. 5 = Bud Bud 04°15' N 46°30' E. 6 = El Ure 03°50' N 43°06' E. 7 = Sciu Manas 02°48' N 43°27' E. 8 = Dinsor 02°24' N 42°59' E. 9 = Rahole 02°08' N 42°37' E. 10 = Between Dinsor and Iach Bravai (Iach Bravai is 01°56' N 43°12' E) about 30 km SSE of Dinsor. 11 = About 6 km E

*(b). Osteology*

Clarke (1981) attempted to infer relationships within the African Raninae at supraspecific level by a cladistic analysis of a sample of osteological characters. While the *Ptychadena*—*Lanzarana*—*Hildebrandtia* line emerged as a distinct, monophyletic unit, there was insufficient 'definition' in terms of the shared derived character state distributions, to permit any firm conclusion on interrelationships within the unit. The suggestion that *Hildebrandtia* (?) *largeni* (= *Lanzarana*) is more closely related to *Hildebrandtia* than to *Ptychadena* was made as much on the basis of character state polarities as on the sharing of one particular uniquely derived character state; viz. 13-3 'anterior ramus of pterygoid . . . separated from lateral border of planum antorbitale by a very small gap'.

In the present paper, it is suggested that external morphological evidence supports the theory that *Lanzarana* is more closely related to *Hildebrandtia*.

**Generic status of *Lanzarana***

*Lanzarana* is here accorded full generic status because although it occupies, to some extent, an intermediate position between *Ptychadena* and *Hildebrandtia* it lacks the derived character states shown by *Ptychadena*, and more importantly lacks derived states shown by *Hildebrandtia* (see Clarke, 1981). *Lanzarana* is therefore a genus within the definition given by Mayr (1969) 'A genus is a taxonomic category containing a single species, . . . which is separated from other taxa of the same rank [other genera] by a decided gap'. Further, on present evidence *Ptychadena*, *Lanzarana* and *Hildebrandtia* occupy different ecological niches and may each therefore be regarded as a full genus; criterion of Inger (1958).

**Acknowledgements**

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***Lanzarana* study material**

*largeni*: 94 specimens including 1 disarticulated dry skeleton (DS) and 1 cleared and stained preparation (C & S). MF 2733 (paratype: C & S), MF 2734-35 (paratypes), MF 2554, 2557, 2560-62, MF 10037-42, MF 11594-11611, MF 11631-37, MF 11640-56, MF 11667-68, MF 11689, MF 11830, MF 12004-12, 12014, 12016, MF (temporary numbers) 1980/1-1980/10, 8 unregistered MF specimens, BM 1931.8.1.67-68, BM 1980.1164-65, BM 1980.1166 (DS).

Abbreviations used:

BM British Museum (Natural History)

MF Museo Zoologico de 'La Specola', Florence.

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